

REMARKS

I. Introduction

Claims 1 to 14 are pending in the present application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Rejection of Claims 1 to 5 and 7 to 11 Under 35 U.S.C. § 103(a)

Claims 1 to 5 and 7 to 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of International Published Patent Application No. WO 98/53229 (“Werner et al.”) and U.S. Patent No. 6,471,212 (“Dierker et al.”). Applicants respectfully submit that the combination of Werner et al. and Dierker et al. does not render obvious the present claims for the following reasons.

Claims 1 and 9 relate to a brush seal for sealing a rotor with respect to a stator. Claims 1 and 9 have been amended herein without prejudice to recite that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing. Support for this amendment may be found, for instance, at page 4, lines 14 to 20 of the Specification which states that “in the event of incorrect installation, during which the bristles would be oriented against the direction of rotation of the rotor, assembly of the brush seal is prevented, since the fastening element to be finally used cannot be fitted.” Thus, reversed mounting of the bristle housing, e.g., mounting such that the bristles would be oriented against the direction of rotation of the rotor, may be prevented.

Applicants respectfully submit that the combination of Werner et al. and Dierker et al. does not render obvious claims 1 and 9 for at least the reason that the combination of Werner et al. and Dierker et al. fails to disclose, or even suggest, all of the limitations recited in claims 1 and 9. For example, the combination of Werner et al. and Dierker et al. fails to disclose, or even suggest, that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing, as recited in claims 1 and 9. The Specification states at page 1, lines 18 to 28, that “[t]he bristles of the brush seals can be set in the direction of rotation of the rotor at an angle of, for example, 40° to 50°, in order to permit a smooth, radial deflection of the bristles upon contact with the rotor [and that on] account of the set bristles, reliable functioning in the event of incorrect installation of the

brush seal, i.e., the brush seal is inserted in the incorrect orientation into its seat on the stator or rotor and the bristles are set against the direction of rotation of the rotor, is not ensured, since the bristles can partly bend to a considerable extent.” The Specification also states at page 1, line 33 to page 2, line 1 that a correct installation of the brush seal may ensured when the brush seal is assembled.

Werner illustrates a lip of a supporting plate 3 that fits within an axially-disposed cut-out in a stator 2. This arrangement does not prevent relative rotation of the bristle housing, and therefore Werner does not disclose or suggest an arrangement that prevents relative rotation. Furthermore, the Final Office Action identifies cutout 12 and shoulder 13 as first and second positioning arrangements, respectively. However, this shoulder 13 is described as preventing radial movement of a guide plate 8 so as to maintain as small a gap 9 as possible. To accomplish this objective, the shoulder 13 (and the cut-out 12 into which it fits) extend circumferentially all of the way around blade carrier 1. This arrangement also does not prevent relative rotation of the bristle housing, and therefore Dierker also does not disclose or suggest an arrangement that prevents relative rotation.

Also, Dierker states that “the ring part [15 is] knocked into the groove.” Col. 2, lines 40-41. Thus, Dierker provides an arrangement in which a ring 15 must be “knocked” into place after the guide plate 8 and the body 7 (holding the bristles) have already been installed. This arrangement does not prevent reversed mounting of the body 7. As an initial matter, the body 7 is symmetrical and thus may be mounted in a reversed position relative to the guide plate 8. Even if the body 7 is correctly mounted relative to the guide plate 8, these two components may together be reversely mounted within the blade carrier 1 because the ring 15 may be subsequently forced into position, e.g., by knocking, even if the body 7 and guide plate are reversely mounted.

Still further, there would have been no motivation to combine the two cited references. For instance, Dierker states that “[t]he higher the pressure ..., the smaller the gap must be between the side wall and the opposite component, so that the brushes ... do not spring back too far and thus result in too large a sealing gap ... [because, in] such brush seals, it is not permissible to fall short of a play which is necessary.” Col. 1, lines 38-43. Thus, the problem to be solved by Dierker is the prevention of radial movement of a guide plate 8 so as to maintain as small a gap 9 as possible. Werner already solves this problem by virtue of a lip of a supporting plate 3 that fits within an axially-disposed cut-out in a stator 2. Therefore, a person skilled in the art would not have been motivated to combine the teachings of Dierker with Werner, since Werner had already solved the problem addressed in Dierker. With

respect to the problem of relative rotation, a person skilled in the art would not have been motivated to consider the teachings of Dierker because, for the reasons set forth above, Dierker does not disclose how to prevent relative rotation.

To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Since the combination of Werner et al. and Dierker et al. does not disclose, or even suggest, all of the limitations of claims 1 and 9 as more fully set forth above, it is respectfully submitted that the combination of Werner et al. and Dierker et al. does not render obvious claims 1 and 9. In view of the foregoing, withdrawal of the rejection of claims 1 and 9 is respectfully requested.

In addition, Applicants respectfully submit that claims 2 to 5, 7, 8, 10 and 11, which ultimately depend from claim 1, and therefore include all of the limitations of claim 1, are also not rendered unpatentable by the combination of Werner et al. and Dierker et al. for at least the same reasons given above in support of the patentability of claim 1. In re Fine, supra (any dependent claim depending from a non-obvious independent claim is non-obvious).

III. Rejection of Claims 6, 8 and 9 Under 35 U.S.C. § 103(a)

Claims 6, 8 and 9 were rejected under 35 U.S.C. § 103(a) as unpatentable over Werner et al. and Dierker et al., and further in view of U.S. Patent No. 6,106,190 (“Nakamura et al.”). Final Office Action at p. 5. It is respectfully submitted that the combination of Werner et al., Dierker et al. and Nakamura et al. does not render obvious claims 6, 8 and 9 for the following reasons.

Claim 6 relates to a brush seal for sealing a rotor with respect to a stator. Claim 6 has been amended herein without prejudice to recite that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing. Support for this amendment may be found, for instance, at page 4, lines 14 to 20 of the Specification which states that “in the event of incorrect installation, during which the bristles would be oriented against the direction of rotation of the rotor, assembly of the brush seal is prevented, since the fastening element to be finally used cannot be fitted.” Thus, reversed mounting of

the bristle housing, e.g., mounting such that the bristles would be oriented against the direction of rotation of the rotor, may be prevented.

Applicants respectfully submit that the combination of Werner et al., Dierker et al. and Nakamura et al. does not render obvious claims 6 and 9 for at least the reason that the combination of Werner et al., Dierker et al. and Nakamura et al. fails to disclose, or even suggest, all of the limitations recited in claims 6 and 9. For example, the combination of Werner et al., Dierker et al. and Nakamura et al. fails to disclose, or even suggest, that the first positioning arrangement and the second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of the bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing, as recited in claims 6 and 9. As more fully set forth above in connection with claim 9, neither Werner et al. nor Dierker et al. discloses or suggests such an arrangement. Furthermore, Nakamura et al. is not relied on for disclosing or suggesting, and does not disclose or suggest, first and second positioning elements that interact with each other in a positive-locking manner and to provide definite positioning of a bristle housing so as to prevent relative rotation and reversed mounting of the bristle housing. The Office Action states that “Nakamura teaches a projection (66b in Figure 5b) on a first positioning element (66b) which fits into a recess (62b) of the second positioning element (60) to prevent the two elements from rotating with respect to one another.” Office Action at page 6. However, Nakamura et al. are directed to a marine fender with a structure for fixing a pad to a fender frame. Abstract at line 1. Thus, there would have been no motivation at the time the invention was made to combine the teachings of a brush seal with the teachings of marine fender installations.

Therefore, Applicants respectfully submit that the combination of Werner et al., Dierker et al. and Nakamura et al. does not render unpatentable claims 6 and 9. Withdrawal of the rejection of these claims is therefore respectfully requested.

In addition, Applicants respectfully submit that claim 8, which depends from claim 1 and therefore includes all of the limitations of claim 1, is also not rendered unpatentable by the combination of Werner et al., Dierker et al. and Nakamura et al. Since claim 8 depends from independent claim 1, and since Nakamura et al. simply do not cure the critical deficiencies of Werner et al. and Dierker et al., as more fully described above, it is respectfully submitted that claim 8 is allowable for at least the same reasons more fully set forth above in support of the patentability of claim 1. In re Fine, supra.

IV. Rejection of Claims 12 and 13 Under 35 U.S.C. § 103(a)

Claim 12 and 13 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Werner et al., Dierker et al., and U.S. Patent No. 5,066,024 (“Reisinger et al.”). It is respectfully submitted that the combination of Werner et al., Dierker et al. and Reisinger et al. does not render unpatentable claims 12 and 13 for the following reasons.

As more fully set forth above, the combination of Werner et al. and Dierker et al. does not disclose, or even suggest, all of the limitations of claim 1. Claims 12 and 13 depend from claim 1 and therefore include all of the limitations of claim 1. Reisinger et al. are not relied on for disclosing or suggesting, and do not disclose or suggest, those features of claim 1 not disclosed or suggested by the combination of Werner et al. and Dierker et al. For instance, Reisinger et al. are not relied on to disclose or suggest, and do not disclose or suggest, that a first positioning arrangement and a second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of a bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing, which as more fully described above, is not disclosed or suggested by the combination of Werner et al. and Dierker et al. Rather, Reisinger et al. describe “[a] brush seal 1a [that] is fixed in a casing 16 by means of securing rings.” Column 3, lines 14 to 15. However, Reisinger et al. do not describe an arrangement for preventing the relative rotation of the casing 16 and the securing rings 17.

Since claims 12 and 13 depend from independent claim 1, and since Reisinger et al. simply do not cure the critical deficiencies of the combination of Werner et al. and Dierker et al., it is respectfully submitted that claims 12 and 13 are allowable for at least the reasons set forth above. Withdrawal of this rejection is therefore respectfully requested.

V. Rejection of Claim 14 Under 35 U.S.C. § 103(a)

Claim 14 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Werner et al., Dierker et al., and U.S. Patent No. 5,066,025 (“Hanrahan”). It is respectfully submitted that the combination of Werner et al., Dierker et al. and Hanrahan does not render obvious claim 14 for the following reasons.

As more fully set forth above, the combination of Werner et al. and Dierker et al. does not disclose, or even suggest, all of the limitations of claim 1. Claim 14 depends from claim 1 and therefore includes all of the limitations of claim 1. Hanrahan is not relied on to disclose or suggest, and does not disclose or suggest, those features of claim 1 not disclosed or suggested by the combination of Werner et al. and Dierker et al. For instance, Hanrahan is not relied on to disclose or suggest, and does not disclose or suggest, that a first positioning arrangement and a second positioning arrangement are configured to interact with each other in a positive-locking manner and to provide definite positioning of a bristle housing so as to prevent relative rotation and reversed mounting of the entire bristle housing, which as set forth more fully above, is not disclosed or suggested by the combination of Werner et al. and Dierker et al. Since claim 14 depends from independent claim 1, and since Hanrahan simply does not cure the critical deficiencies of the combination of Werner et al. and Dierker et al., it is respectfully submitted that claim 14 is allowable for at least the reasons more fully set forth above. Withdrawal of this rejection is therefore respectfully requested.

VI. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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